Title: Magic Mosaics

Brief Overview:

In this unit the students will demonstrate a fundamental knowledge of graphing and analyzing classroom data, manipulating equivalent fractions, and investigating probability outcomes. After completing several activities, the students will design a patterned mosaic tile and write a friendly letter to inform an administrator to select their product.

NCTM 2000 Principles for School Mathematics:

- **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Links to NCTM 2000 Standards:

- **Content Standards**

Number and Operations

- *Understand numbers, ways of representing numbers, relationships among numbers, and number systems.*
- *Understand meanings of operations and how they relate to one another.*
- *Compute fluently and make reasonable estimates.*

Algebra

- *Understand patterns, relations, and functions.*
- *Represent and analyze mathematical situations and structures using algebraic symbols.*
- *Use mathematical models to represent and understand quantitative relationships.*
- *Analyze change in various contexts.*

Geometry

- *Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.*
- *Specify locations and describe spatial relationships using coordinate geometry and other representational systems.*
- *Apply transformations and use symmetry to analyze mathematical situations.*
- *Use visualization, spatial reasoning, and geometric modeling to solve problems.*

Data Analysis and Probability

- *Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.*
- *Select and use appropriate statistical methods to analyze data.*
- *Develop and evaluate inferences and predictions that are based on data.*
- *Understand and apply basic concepts of probability.*

- **Process Standards**

Problem Solving

- *Build new mathematical knowledge through problem solving.*
- *Solve problems that arise in mathematics and in other contexts.*
- *Apply and adapt a variety of appropriate strategies to solve problems.*
- *Monitor and reflect on the process of mathematical problem solving.*

Reasoning and Proof

- *Recognize reasoning and proof as fundamental aspects of mathematics.*
- *Make and investigate mathematical conjectures.*
- *Develop and evaluate mathematical arguments and proofs.*
- *Select and use various types of reasoning and methods of proof.*

Communication

- *Organize and consolidate their mathematical thinking through communication.*
- *Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.*
- *Analyze and evaluate the mathematical thinking and strategies of others.*
- *Use the language of mathematics to express mathematical ideas precisely.*

Connections

- *Recognize and use connections among mathematical ideas.*
- *Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- *Recognize and apply mathematics in contexts outside of mathematics.*

Representation

- *Create and use representations to organize, record, and communicate mathematical ideas.*
- *Select, apply, and translate among mathematical representations to solve problems.*
- *Use representations to model and interpret physical, social, and mathematical phenomena.*

Grade/Level:

Grades 3-5 (with modifications)

Duration/Length:

Five class periods (approximately 60 mins. each)

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Recognizing fractions as parts of a whole
- Creating equivalent fractions
- Recognizing basic probability concepts
- Constructing bar and circle graphs from basic data
- Analyzing basic graph data
- Communicating mathematical data through writing a friendly letter
- Identifying basic patterns

Student Outcomes:

Students will:

- collect, organize, and analyze data to create a bar graph and circle graph.
- represent the quantities of various fractions on circle graphs and square grids.
- demonstrate knowledge of basic probability concepts.
- manipulate prior knowledge to create a patterned mosaic tile.
- write to inform the school principal about their patterned mosaic tile.

Materials/Resources/Printed Materials:

- Pencils
- Hershey candy bars (1 for every 4 students)
- Crayons
- Paper clips
- Teacher Resource Sheets #1-12
- Student Resource Sheets #1-16
- Highlighter
- Overhead Projector

Development/Procedures:

Day 1

- Discuss with students the many changes that have been highlighted as the result of a new millennium (i.e., computers, space development, medicine). After several examples have been presented, introduce the prompt to the unit (Student Resource Sheet 1). Discuss examples of tiles used in the real-world with students (i.e., ceramic, floor, wall.etc.).

- Give each student a copy of Student Resource Sheet 2. Display the Teacher Resource Sheet 1, "Voting Colors" on the overhead. Explain to the students that they will be voting on two colors each, so they may only raise their hand twice. Provide an example of how to place a mark on the tally chart using the overhead, so that students will understand what they are to do. Call out each color in order and count the number of hands raised. Have the students fill in the tally marks accordingly as you do the same on the overhead. Ask the students to add the number of tally marks they have for each color, and write their answers in the total column.

- Each student will now graph the class results and answer questions on Student Resource Sheet 3, "Making Our Graph." Using a transparency of Student Resource Sheet 3 on the overhead, provide an example of how to create a bar graph.

- Discuss with the students the elements of the bar graph such as title, labeling of the x and y axes and placement of the numbers on the lines rather than in the spaces. As a modification, you may want to graph the entire graph with student interaction. After the students have completed the graphing activity, direct them to answer the questions at the bottom of the worksheet using the data that they have derived.

Day 2

- Start the lesson by discussing the results of the graphing activity completed on the previous day (Student Resource Sheet 3). Have the students identify the top four colors chosen by the class. Allow time for the students to present their explanations to the last question, regarding how they knew what the top four colors were. Grading criteria for the bar graph can be found on Teacher Resource Sheet 2.

- An idea for reviewing the fractional concepts of "parts of a whole" and "simplifying fractions" would be using a "Hershey Bar" for demonstration. You would present the bar as a whole, then proceed to break it into fractional components (i.e., 1/2, 1/3, 1/4, 1/6) and display these for the students. On the overhead or chalkboard, you can write in several fractions and then discuss the simplification of these fractions (i.e., 2/4, 3/9, 4/6, 5/10, 2/20).

- Distribute one copy of Student Resource Sheet 4, "Fraction Grid," to each student. Read aloud the directions of the activity, or you may have a student do so. Clarify any misconceptions the students may have regarding these directions. Provide examples of how to complete a fraction grid on the overhead or chalkboard. Allow the students time to complete this worksheet independently. Provide time for a discussion regarding the results of this activity. Answers for this activity can be found on Teacher Resource Sheet 3.

- Distribute copies of Student Resource Sheet 5, "Circle Graph Practice," to the class. Read aloud the directions of the activity, or you may have a student do so. Clarify any misconceptions the students may have regarding these directions. Provide examples of how to complete a circle graph on the overhead or chalkboard for student modeling purposes. Allow the students time to complete this worksheet independently. Provide time for a discussion regarding the results of this activity. Answers for this activity can be found on Teacher Resource Sheet 4.

- If you would like to use additional activities regarding fractions, there are two worksheets that have been provided for this purpose. You may chose to use these activities in a variety of ways: to assess prior knowledge, as a review, or as additional work for students who work at a faster pace than the rest of the class. Student Resource Sheet 13, "Simplifying Fractions," provides eight problems for the students to solve. To differentiate this lesson, you may chose to use Student Resource Sheet 14 instead, which presents four problems for the student to solve. Student Resource Sheet 15, "Adding and Subtracting Fractions," provides eight addition/subtraction problems for the students to solve. To differentiate this lesson, you may choose to use Student Resource Sheet 16 instead, which presents four problems for the student to solve. Answers for these extension activities, Student Resource Sheets 13-16, can be found on Teacher Resource Sheets 9-12.

Day 3

- Now that the students have visualized fractional parts of a circle graph (Student Resource Sheet 5), explain that today's lesson will enable the students to form personal opinions about various constructed circle graphs (i.e., spinner). Ask the students to think, pair, share, and develop their definition of the term, probability.

- Have several groups share their ideas and develop a class definition. On the board, have several words listed relating to probability (i.e. equal, unequal, likely, unlikely, fair, unfair) Have the students identify these terms through the use of playing games. For example, Twister will be fair and equal because of the way the spinner is designed.

- Now that the students have prior knowledge, distribute "What Will The Spinner Do?" (Student Resource Sheet 6). Read the directions orally and have one student write the top four colors on the board as a reference for all students. Before the students begin the experiment, encourage students to answer the prediction question at the top of their resource sheet. Remind students to observe the spinner carefully and to explain their prediction.

- Allow each student several minutes to conduct the probability experiment at their desk. As the students finish the experiment, have them respond to the last question on the resource sheet.

- After every student has completed the probability experiment, have the students group cooperatively and discuss individual results. Bring the students back to the whole group and ask for several volunteers to share their observations.

Day 4

- Review with student the results from the spinner activity from the previous day (Student Resource Sheet 6). Have the students communicate their responses using the appropriate vocabulary terms for probability (i.e,. likely, unlikely, equal, unequal, fair, unfair). The students may review and share responses prior to discussion to activate prior knowledge.

- Give each student a copy of Student Resource Sheet 7, "Mosaic Grid". Allow the students one minute to preview the task silently. Have several students share their personal interpretations of the directions. This activity will be completed independently without teacher help. If necessary, model the first fraction for students. A sample response can be found on Teacher Resource Sheet 5.

- After the students have created their mosaic tile, distribute Student Resource Sheet 8. Allow the students one minute to preview the task silently. Have several students share their personal interpretations of the directions. The students will complete this activity without teacher help. If necessary, model the first fraction for students. A sample response can be found on Teacher Resource Sheet 6. A rubric for scoring Student Resource Sheets 7 and 8 can be found on Teacher Resource Sheet 7.

- After both parts of the performance task have been completed, ask the students to review the activities. Have them look for particular items (i.e., right colors used, titled, numbers written, neatness, etc.) Remind the students that they will be writing to inform the principal the following day.

Day 5

- Teacher and students will review Performance Task Activities from the previous days (Student Resource Sheets 7 and 8). The students will review their personal data as the teacher has them look for: three colors being used, a simple pattern, squares counted, and circle graph colored/titled. The teacher may use EPR (Every Pupil Response) to assess student response (i.e., thumbs-up/thumbs down).

- Introduce the last activity for Magic Mosaic. Give each student the writing prompt (Student Resource Sheet 9) and have them preview the activity independently. The teacher will then review the task on the overhead with the students. After students have read the prompt orally, self-select several students to identify items that will need to be included in a friendly letter. As a modification, you may want to highlight the items on both the overhead and on the student resource sheet. Before students begin the writing process, read rubric for writing prompt orally (Teacher Resource Sheet 8).

- Allow the students several minutes to organize and web ideas on the back of the student writing prompt. At student/teacher discretion, begin writing a friendly letter. As a modification, you may want to select either Student Resource Sheet 10 or 11 for differentiation in student writing ability.

- Upon completion of a friendly letter, students will complete the self-assessment for writing, (Student Resource Sheet 12). The friendly letters can be shared in a small group or whole group setting for peer evaluation.

Performance Assessment:

Students will be assessed formally and informally on the following activities:

- Creating and analyzing a bar graph (Teacher Resource Sheet 2)
- Coloring and labeling square grids and a circle graph
- Understanding probability concepts (Spinner Game)
- Designing a patterned mosaic tile (Teacher Resource Sheet 7)
- Creating a circle graph to represent mosaic tile (Teacher Resource Sheet 7)
- Organizing personal ideas (Writing to Inform-Web)
- Writing a friendly letter (Teacher Resource Sheet 8)

Extension/Follow Up:

- Display student models of mosaic tiles for school observation.
- Submit friendly letter to school principal officially.
- Create a three-dimensional model of patterned mosaic tiles.
- Complete worksheet on simplifying fractions (Student Resource Sheets 13 and 14).
- Complete worksheet on adding/subtracting fractions (Student Resource Sheets 15 and 16).

Authors:

Stacey Smith
Solley Elementary
Anne Arundel County, MD

Alicia Brophy
Maryvale Elementary
Montgomery County, MD

VOTING COLORS

COLORS	TALLY	TOTAL
Blue		
Green		
Orange		
Red		
Purple		
Brown		
Yellow		
Black		
Pink		
White		

Student Name: _____

Grading Criteria for Bar Graph

The following items receive a score of zero or one point each, for a total of up to ten points.

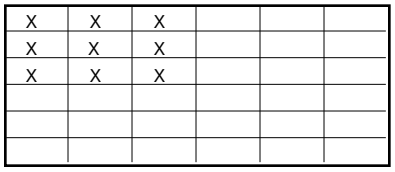
0	**1**	Title
0	**1**	X axis is correctly labeled.
0	**1**	Y axis is correctly labeled.
0	**1**	Numbers written on the lines and not in the spaces.
0	**1**	Numbers are equal units and are appropriately spaced.
0	**1**	Bar graph lines are straight.
0	**1**	Handwriting is legible.
0	**1**	Data is accurately represented.
0	**1**	Appropriate response for first question.
0	**1**	Appropriate response for second question.

Total Points: _____

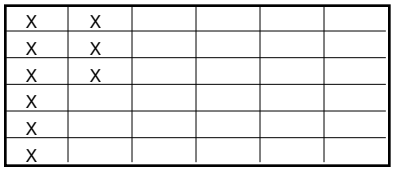
Name:_____ Date:_____

Fraction Grids

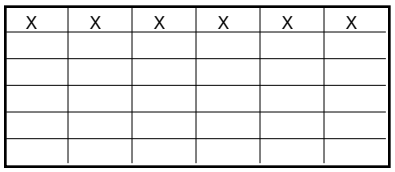
DIRECTIONS: Now that you have identified the top four colors chosen by your class, you will complete the fraction grids below.
Step 1 - Pick one color for each grid and write it on the space provided.
Step 2 - Using the color you chose for each grid, represent the fraction by shading in the correct number of squares.
Step 3 - Write the equivalent fraction for the problems listed below the grids. (Hint: Use your shaded grids to help.)



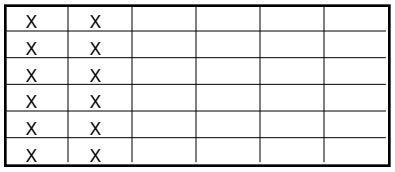
$\frac{1}{4} = \frac{\_\_\_}{36}$ _____



$\frac{1}{4} = \frac{\_\_\_}{36}$ _____



$\frac{1}{6} = \frac{\_\_\_}{36}$ _____

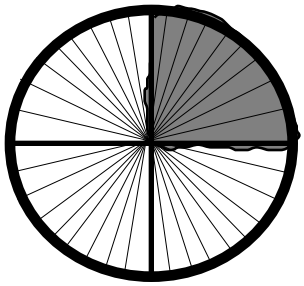


$\frac{1}{3} = \frac{\_\_\_}{36}$ _____

Name:_____ Date:_____

Circle Graph Practice

DIRECTIONS: Now that you have identified the top four colors chosen by your class, you will complete the circle graphs below.
Step 1 - Pick one color for each graph and write it on the space .
Step 2 - Using the color you chose for each graph, represent the fraction by shading in the correct number of sections of the circle.
Step 3 - Write the equivalent fraction for the problems listed below the graphs. (Hint: Use your shaded graphs to help.)



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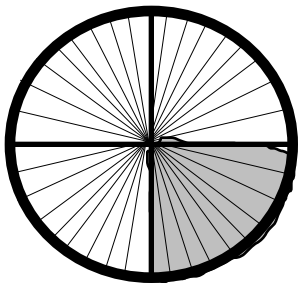

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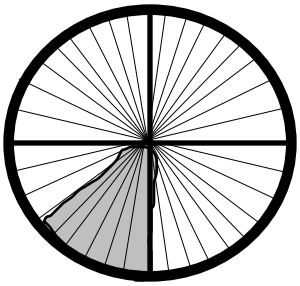
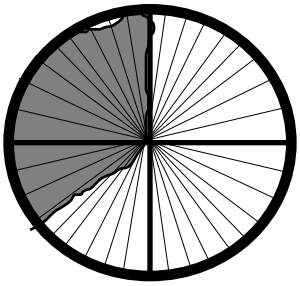


$\frac{1}{6} = \frac{\_\_\_}{36}$ _____



$\frac{1}{3} = \frac{\_\_\_}{36}$ _____

Sample Mosaic Grid

P	P	G	G	P	P
P	P	B	B	P	P
G	B	P	P	B	G
G	B	P	P	B	G
P	P	B	B	P	P
P	P	G	G	P	P

DIRECTIONS: Step 1- Reread the mosaic prompt, and using the colors purple, green and black, create your patterned mosaic above Step 2- Count the number of squares you used for each color. Write in the number of squares for each color below.

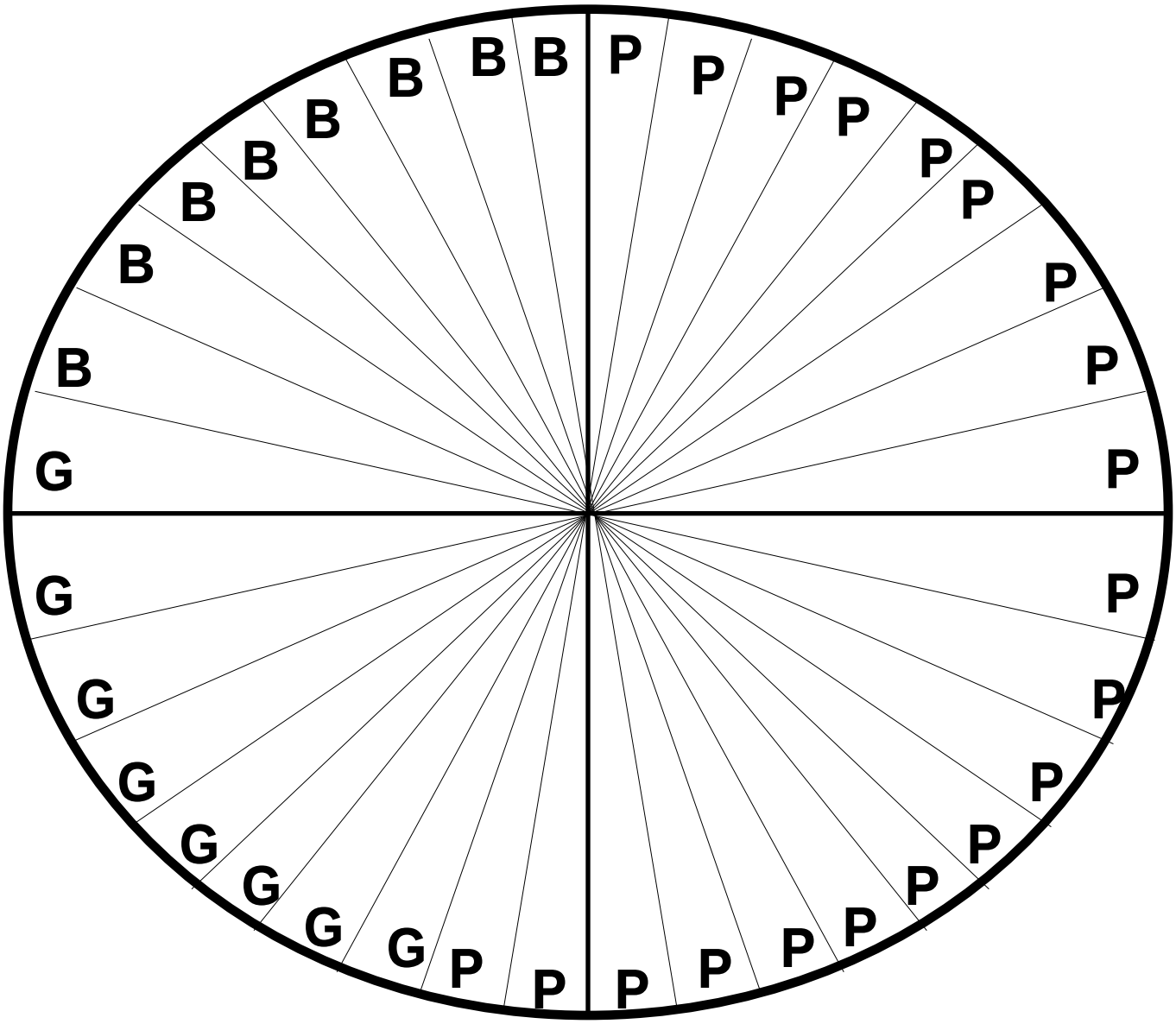
Purple: 20 Green: 8 Black: 8

Sample Circle Graph

Directions: Now that you have identified the number of squares you colored for each of the three colors, you will now create a circle graph with your data. (Hint: Remember, the number of slices filled in for each color should match the number colored in on your mosaic tile.)

_____

Title



Student Name: _____

Performance Assessment Rubric

(for Student Resources 7 and 8)

3 Points:

- ◇ Coloring and handwriting are clear and legible.
- ◇ All three colors are represented on the mosaic and circle graph (Purple, Green and Black).
- ◇ Created a simple pattern for the mosaic.
- ◇ Correctly counted the number of squares per color.
- ◇ Circle graph appropriately matches data derived from mosaic grid.

2 Points:

- ◇ Coloring and handwriting are somewhat clear and understandable.
- ◇ All three colors are represented on the mosaic and circle graph.
- ◇ Created a simple pattern for the mosaic.
- ◇ Minor inaccuracies in counting the number of squares per color.
- ◇ Circle graph is closely related to data derived from mosaic grid.

1 Point:

- ◇ Coloring and handwriting are not clear and understandable.
- ◇ Colors are inaccurately represented on mosaic and circle graph.
- ◇ Pattern is missing from the mosaic.
- ◇ Serious inaccuracies in counting the number of squares per color.
- ◇ Circle graph is barely related to data derived from mosaic grid.

0 Points:

- ◇ Did not follow directions to performance tasks.

Student Name: _____

Writing Rubric

(for Student Resource 10 or 11)

3 Points:

- ◇ Handwriting is clear and legible.
- ◇ Correct capitalization, usage, punctuation, and spelling (CUPS).
- ◇ Contains all parts of a friendly letter.
- ◇ Complete sentences are used.
- ◇ Clear explanation of their pattern, color choice and fractional parts.

2 Points:

- ◇ Handwriting is somewhat clear and understandable.
- ◇ Minor inaccuracies in capitalization, usage, punctuation, and spelling (CUPS).
- ◇ Contains most parts of a friendly letter.
- ◇ Minor inaccuracies in sentence structure.
- ◇ Reasonably clear explanation of their pattern, color choice and fractional parts.

1 Point:

- ◇ Handwriting is not clear and understandable.
- ◇ Serious inaccuracies in capitalization, usage, punctuation, and spelling (CUPS).
- ◇ Contains few parts of a friendly letter.
- ◇ Serious inaccuracies in sentence structure.
- ◇ Unclear explanation of their pattern, color choice and fractional parts.

Name:_____ Date:_____

SIMPLIFYING FRACTIONS

DIRECTIONS: Listed below are several fractions that can be reduced to a simpler term. Use the space provided for each fraction to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{4}{8} = \frac{1}{2}$	$\frac{3}{12} = \frac{1}{4}$
$\frac{3}{9} = \frac{1}{3}$	$\frac{4}{16} = \frac{1}{4}$
$\frac{2}{10} = \frac{1}{5}$	$\frac{4}{6} = \frac{2}{3}$
$\frac{6}{18} = \frac{1}{3}$	$\frac{7}{14} = \frac{1}{2}$

Name:_____ Date:_____

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$\frac{4}{8} = \frac{1}{2}$	$\frac{3}{12} = \frac{1}{4}$
$\frac{3}{9} = \frac{1}{3}$	$\frac{4}{16} = \frac{1}{4}$

Name:_____ Date:_____

ADDING AND SUBTRACTING FRACTIONS

DIRECTIONS: Listed below are several addition and subtraction problems involving fractions. Use the space provided to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$	$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$
$\frac{4}{8} - \frac{3}{8} = \frac{1}{8}$	$\frac{2}{12} - \frac{1}{12} = \frac{1}{12}$
$\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$	$\frac{4}{7} - \frac{3}{7} = \frac{1}{7}$
$\frac{5}{14} + \frac{8}{14} = \frac{13}{14}$	$\frac{8}{14} - \frac{3}{14} = \frac{5}{14}$

Name:_____ Date:_____

ADDING AND SUBTRACTING FRACTIONS

DIRECTIONS: Listed below are several addition and subtraction problems involving fractions. Use the space provided to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$	$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$
$\frac{4}{8} - \frac{3}{8} = \frac{1}{8}$	$\frac{2}{12} - \frac{1}{12} = \frac{1}{12}$

Magic Mosaic

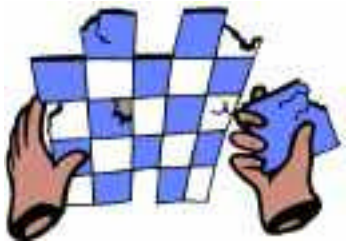
The new millennium has brought about many changes in the world. Your school principal has decided to make a change in your school. and would like to place a mosaic patterned tile in the front lobby of the school. Your class has been chosen to create different designs for the mosaic tile. Over the next several days, you will complete activities that will enable you to use your imagination to create a tile.

Name:_____ Date:_____

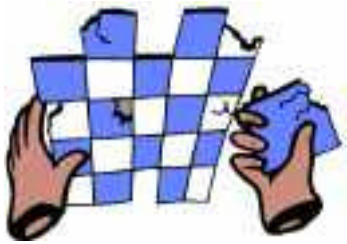
Voting Colors

DIRECTIONS: Each member of your class will vote for their top two favorite colors. Place a tally mark in the row next to the color chosen for each student's vote. When every student has voted twice, total the number of tallies for each color in the total column.

COLORS	TALLY MARK	TOTAL
Blue		
Green		
Orange		
Red		
Purple		
Brown		
Yellow		
Black		
Pink		
White		



Making Our GRAPH



Title

Label

The four most popular colors are _____

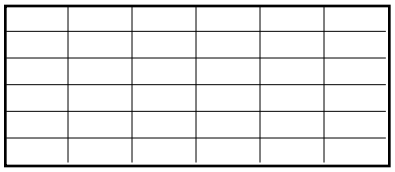
I know this because _____

Name:_____ Date:_____

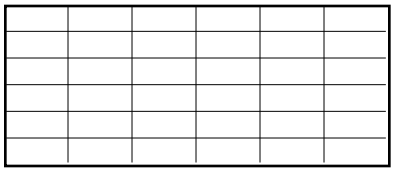
Fraction Grids

DIRECTIONS: Now that you have identified the top four colors chosen by your class, you will complete the fraction grids below.

Step 1 - Pick one color for each grid and write it on the space provided.
Step 2 - Using the color you chose for each grid, represent the fraction by shading in the correct number of squares.
Step 3 - Write the equivalent fraction for the problems listed beside each grid. (Hint: Use your shaded grids to help.)



$\frac{1}{4} = \frac{\_\_\_}{36}$ _____



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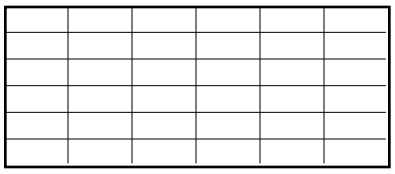
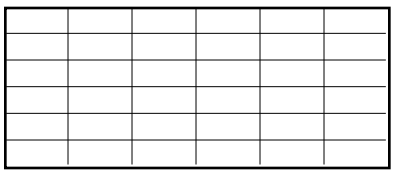


$\frac{1}{6} = \frac{\_\_\_}{36}$ _____



$\frac{1}{3} = \frac{\_\_\_}{36}$ _____

Name:_____ Date:_____

Circle Graph Practice

DIRECTIONS: Now that you have identified the top four colors chosen by your class, you will complete the circle graphs below.

Step 1 - Pick one color for each graph and write it on the space .
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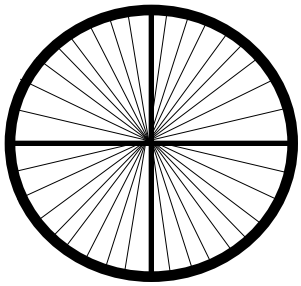
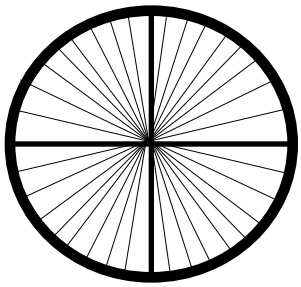
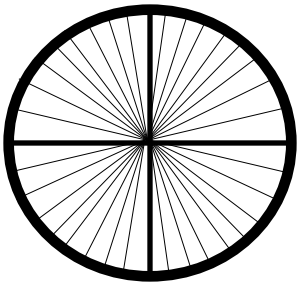
Step 3 - Write the equivalent fraction for the problems listed below the graphs. (Hint: Use your shaded graphs to help.)



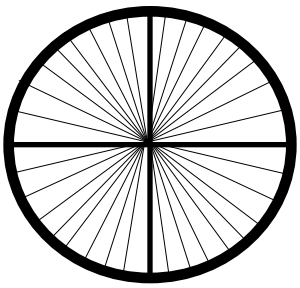
$\frac{1}{4} = \frac{\_\_\_}{36}$ _____



$\frac{1}{4} = \frac{\_\_\_}{36}$ _____



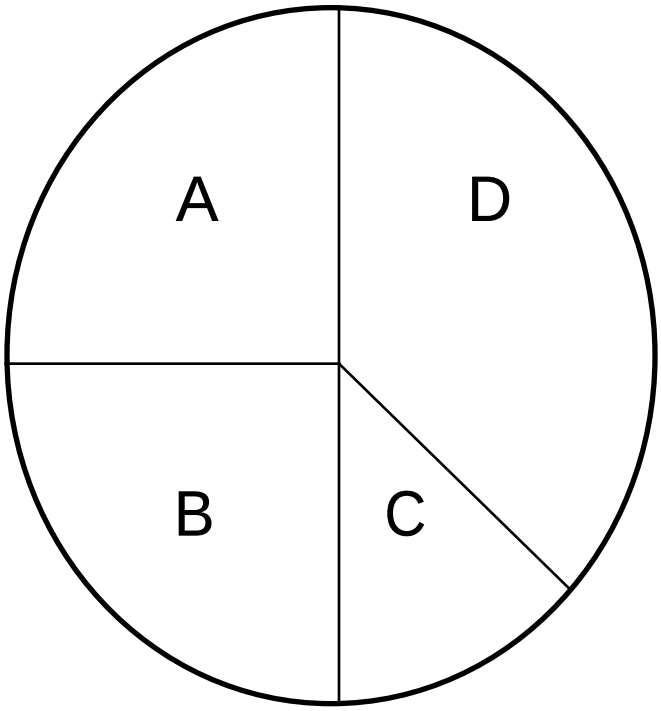
$\frac{1}{6} = \frac{\_\_\_}{36}$ _____



$\frac{1}{3} = \frac{\_\_\_}{36}$ _____

What Will The Spinner Do?

Directions: Color the four sections of the spinner below using the colors that were voted the most popular. Predict what will happen when you spin 36 times. Spin, tally your results, and compare to your prediction.



When I spin 36 times, I predict that _____

Now that I have spun, I notice that _____

Color	Amount of times spun
A	
B	
C	
D	

Name: _____ Date:_____

Mosaic Grid

DIRECTIONS: *Step 1* - Reread the mosaic prompt, and using the colors purple, green and black, create your patterned mosaic above. You must color every square. *Step 2* - Count the number of squares you used for each color. Write in the number of squares for each color below.

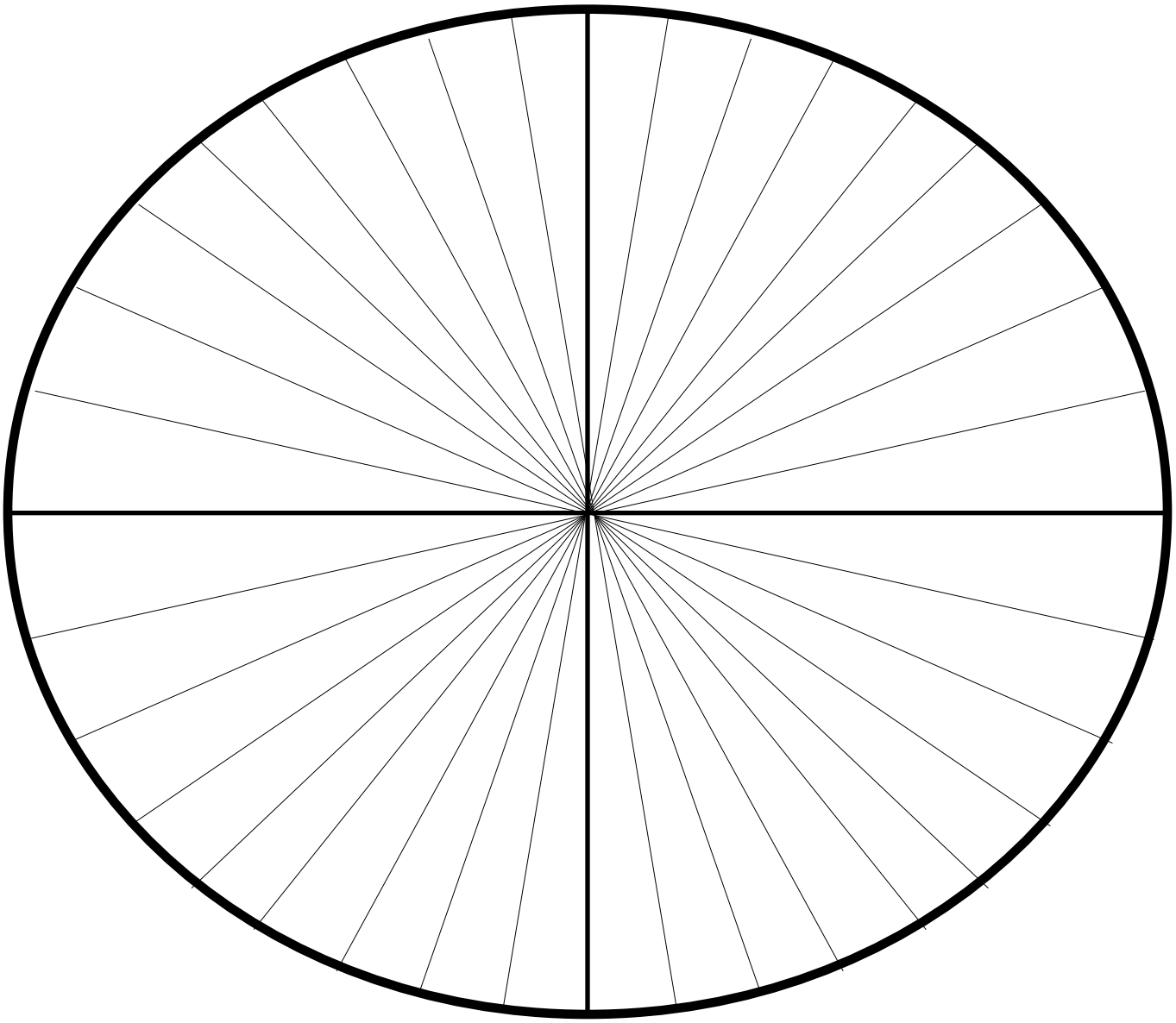
Purple: _____ Green: _____ Black: _____

Name:_____ Date:_____

Directions: Now that you have identified the number of squares you colored for each of the three colors, you will now create a circle graph with your data. (Hint: Remember, the number of slices filled in for each color should match the number colored in on your mosaic tile.)

_____

Title



Writing Prompt for Magic Mosaic

Your class has been chosen to create different designs for the lobby's new mosaic tile. Put on your "magic" thinking cap and reflect on the previous days' activities. You will be writing a letter to inform the principal about your mosaic tile. In your friendly letter you will need to include the following:

- Correct capitalization, usage, punctuation, and spelling (CUPS)
- Clear and legible handwriting
- Complete sentences
- Clear explanation of pattern, color choice and fractional parts
- Correct letter format

Before you begin to write your letter, take a few minutes to organize your thoughts. You may use the back of this paper to web out your ideas. Good luck!

Friendly Letter Form

_____

_____,

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

_____,

_____

Friendly Letter Form

_____

Date

_____,

Opening

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____,

Closing

_____

Your Name

Self-Assessment for Writing

1. I capitalized the beginnings of all my sentences.


2. I used the correct punctuation at the end of each sentence.


3. I made complete sentences.


4. I have a topic sentence and a closing sentence.


5. I have included at least three supporting details.


6. I have completed all parts of the friendly letter.


Name:_____ Date:_____

SIMPLIFYING FRACTIONS

DIRECTIONS: Listed below are several fractions that can be reduced to a simpler term. Use the space provided for each fraction to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{4}{8}$	$\frac{3}{12}$
$\frac{3}{9}$	$\frac{4}{16}$
$\frac{2}{10}$	$\frac{4}{6}$
$\frac{6}{18}$	$\frac{7}{14}$

Name:_____ Date:_____

SIMPLIFYING FRACTIONS

DIRECTIONS: Listed below are several fractions that can be reduced to a simpler term. Use the space provided for each fraction to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{4}{8}$	$\frac{3}{12}$
$\frac{3}{9}$	$\frac{4}{16}$

Name:_____ Date:_____

ADDING AND SUBTRACTING FRACTIONS

DIRECTIONS: Listed below are several addition and subtraction problems involving fractions. Use the space provided to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{1}{4} + \frac{2}{4}$	$\frac{3}{8} + \frac{2}{8}$
$\frac{4}{8} - \frac{3}{8}$	$\frac{2}{12} - \frac{1}{12}$
$\frac{2}{5} + \frac{2}{5}$	$\frac{4}{7} - \frac{3}{7}$
$\frac{5}{14} - \frac{8}{14}$	$\frac{8}{14} - \frac{3}{14}$

Name:_____ Date:_____

ADDING AND SUBTRACTING FRACTIONS

DIRECTIONS: Listed below are several addition and subtraction problems involving fractions. Use the space provided to show your work. (Hint: You may need to draw pictures.) Be sure to circle your final answer in each box.

$\frac{1}{4} + \frac{2}{4}$	$\frac{3}{8} + \frac{2}{8}$
$\frac{4}{8} - \frac{3}{8}$	$\frac{2}{12} - \frac{1}{12}$